

**UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION
OFFICE OF ENERGY POLICY AND INNOVATION**

**Rates, Accounting and Financial Reporting)
for New Electric Storage Technologies) Docket No. AD10-13-000**

COMMENTS OF DR. LAURENCE D. KIRSCH

I. QUALIFICATIONS

1. My name is Laurence D. Kirsch. I am a Senior Consultant with Christensen Associates Energy Consulting, LLC, 800 University Bay Drive, Suite 400, Madison, Wisconsin, email address LDKirsch@CAEnergy.com.
2. I hold a Ph.D. in economics from the University of Wisconsin and an A.B. in economics from the University of California. I have spent the past quarter century specializing in economic analyses of the electric power industry, with a focus on the efficient pricing of electricity services at both the wholesale and retail levels. My work has included studies of wholesale market design, bulk power markets, power pool operations, electric power system cost structures, reliability costs, unbundled service pricing, and market power. My clients have included numerous large utilities, small utilities, power system operators, regulatory agencies, and power industry coalitions. Although most of my work has been in the United States, I have also had projects in other countries.
3. I have testified before state and federal regulatory agencies, including the Federal Energy Regulatory Commission (Commission), on a wide range of electric industry restructuring issues including stranded costs, market power, transmission rate design, and the costs and benefits of membership in Regional Transmission Organizations (RTOs). For example, I have provided testimony or affidavits on the grid management charge of the California Independent System Operator (Docket Nos. ER01-313-000, ER01-313-001, ER01-424-000, and ER01-424-001), on proposed congestion management and redispatch cost allocation policies of the Midwest Independent System Operator (Docket No. ER02-1767-000), on supply margin assessment and other market power metrics (Docket Nos. PL02-08-000 and RM01-12-000), on the market power conduct and impact thresholds of the Midwest Independent Transmission System Operator (Docket Nos. ER03-323-000 and ER07-1372-000), and on the offer caps of the PJM Interconnection (Docket No. EL03-236-006).

II. PURPOSE OF MY COMMENTS

4. The Office of Energy Policy and Innovation, in a Notice dated June 11, 2010, has requested comments “regarding rates, accounting and financial reporting associated with services provided by electric storage technologies.” I am concerned that the Commission accurately define the services that are provided by such technologies so that the providers of such

technologies are fully and fairly compensated, so that the owners of certain generating technologies are not inadvertently subsidized through mispricing of storage technology services, and so that consumers do not pay for vaguely defined services that they do not in fact receive. The overriding purpose of my comments is to point out that the providers of electric storage technologies will be fully and fairly compensated if they are simply paid for services that have already been defined by the Commission as part of its mandated Open Access Transmission Tariffs (OATTs).

III. ELECTRIC STORAGE TECHNOLOGY SERVICES CAN BE FULLY AND FAIRLY COMPENSATED AS SERVICES THAT THE COMMISSION HAS ALREADY DEFINED.

5. Electric storage facilities create three kinds of value, all of which can be compensated according to FERC-approved rules applicable to generators.

6. First, storage facilities have an energy value due to their ability to “charge up” when the power system’s marginal cost of electrical energy is relatively low (e.g., in off-peak periods) and release energy when the power system’s marginal cost of electrical energy is relatively high (e.g., in on-peak periods). For any particular storage facility, the value of these energy shifts among periods equals the value of power that the storage facility provides to the power system minus the value of power that the storage facility takes from the power system. In any period (e.g., dispatch interval) when the storage facility provides power, the value of power so provided equals the quantity of power provided times the power system’s marginal cost of electrical energy. In any period when the storage facility takes power, the value of power so taken equals the quantity of power taken times the power system’s marginal cost of electrical energy. In competitive power markets, the price of electrical energy will approximate the marginal cost of electrical energy. Consequently, a storage facility’s energy value will equal the revenues that the storage facility earns by selling power at the market price when it provides power to the system minus the payments that the storage facility makes to purchase power at the market price when it takes power from the system. The key consideration is whether the market price of electrical energy is determined by competition: if it is, a storage facility’s energy market transactions will fully compensate it for the energy value that it provides to the power system.

7. Second, storage facilities can provide regulation, spinning reserve, and non-spinning reserve services. The compensation for these services should be at the ancillary service prices applicable to other resources that provide these services. It would be just and reasonable for the ancillary service prices paid to different resources to be adjusted to reflect differences in quality (e.g., speed and reliability of response) among the services provided by different resources. Storage facilities should receive higher ancillary service prices if and only if they provide higher quality ancillary services than are provided by traditional generation: the key factor in differentiating ancillary service prices among resources should be the quality of the service provided, not the identity *per se* of the technology providing the service.

8. Third, storage facilities can provide voltage support service. Ideally, the compensation for this service would reflect the value of voltage support at the times when and places where storage facilities provide such support. As a practical matter, however, neither the Commission, the RTOs, nor transmission owners have found means for accurately quantifying this time-

varying and location-varying value. Consequently, the OATT prices for voltage support service will need to suffice as a rough approximation for these values.

9. In summary, storage facilities sometimes behave like a generator and sometimes like a load. When a storage facility behaves like a generator, it would be just and reasonable for the storage facility to be compensated for the services it provides like any other generator. When a storage facility behaves like a load, it would be just and reasonable for the storage facility to pay for the services it takes like any other bulk power-level customer (i.e., like load-serving entities). FERC-approved OATTs already set the prices for all of the services that storage facilities provide when they behave like generators. When storage facilities behave like loads, they can simply pay these same prices for the services that they use, which is what loads in effect already pay for energy in those RTO markets with locational marginal pricing (LMP).

IV. THE VARIOUS USES OF STORAGE THAT ARE IDENTIFIED IN THE NOTICE ARE DERIVATIVES OF SERVICES THAT THE COMMISSION HAS ALREADY DEFINED, SO THERE IS NO NEED TO DEFINE ADDITIONAL SERVICES THAT ARE PECULIAR TO STORAGE.

10. The value that electric storage facilities provide in “maintaining service to unbundled transmission customers” is accomplished through these facilities providing energy and ancillary services. No additional value needs to be attached to “maintaining service” beyond the values of the underlying energy and ancillary services.

11. For example, the value that electric storage facilities provide as a “virtual replacement transmission circuit in the event of a transmission line trip” is accomplished through these facilities providing energy and ancillary services where they are needed most. In markets with LMP pricing of energy and sub-regional pricing of reserves, energy and ancillary services prices will reflect the value of congestion and thus provide just and reasonable compensation for a storage facility’s service as a “virtual replacement transmission circuit.” In markets without suitable locational pricing, such as the Western Grid situation cited in the Notice, just and reasonable compensation would be based upon best estimates of the locational values of energy and ancillary services rather than upon a value attached to a new “virtual replacement transmission service.”

12. The notion that electric storage facilities can “enhance the value of generation” arises from certain adverse characteristics of intermittent resources. Specifically: a) intermittent resources have low capacity values due to their poor load factors; and b) intermittent resources that have relatively high off-peak availability provide energy with relatively low value. Electric storage facilities are rightly viewed as one potential means of compensating for these adverse characteristics. But again, the value that electric storage facilities provide in “enhancing the value of generation” is accomplished solely through storage facilities’ provision of energy and ancillary services. Because the adverse characteristics of intermittent resources are likely to increase peak-to-off-peak energy price differentials and to also increase the value of regulation and operating reserves, power systems with intermittent resources are likely to offer better profit opportunities for electric storage facilities than power systems without such resources, all other things equal. Consequently, no additional value needs to be attached to “enhancing the value of generation” beyond the values of the underlying energy and ancillary services.

13. The Notice correctly asserts that a generation owner who builds a storage facility to enhance the value of its generation should recover its costs “through the generator’s wholesale energy charges alone.” It is important to note, however, that the identity of the owner of the storage facility – whether a generator, a transmission firm, a load-serving entity, or an independent storage firm – has absolutely no effect on the efficient dispatch of the facility or the overall costs of the power system. The principle of non-discrimination requires that, unless cost-of-service recovery is otherwise mandated by law or regulation, the identity of the owner should also have no effect on the manner of cost recovery. For example, a load-serving entity should invest in a storage facility only if the value of that facility – in reducing on-peak electrical energy purchases in exchange for increasing off-peak energy purchases – is more than sufficient to cover the capital and operating costs of the facility. Not only would “no Commission-jurisdictional cost recovery ... be permissible,” as stated in the Notice, but such cost recovery would also be unnecessary: if the storage facility was worth building, then its costs would be fully recovered through the load-serving entity’s savings in the Commission-approved wholesale energy markets. Furthermore, because the value of a storage facility as a demand response resource is fully reflected in the on-peak energy savings of such a facility, no additional value needs to be attached to such demand response beyond the values of the underlying energy service.

14. The fact that electric storage facilities can serve multiple purposes does not distinguish such facilities from generators, which can also serve these same multiple purposes.

V. ASIDE FROM VOLTAGE CONTROL SERVICE, THE OWNERS OF ELECTRIC STORAGE FACILITIES SHOULD HAVE NO GUARANTEE OF COST RECOVERY.

15. Aside from voltage support, storage facilities do not behave like transmission assets; and even with respect to voltage support services, storage facilities generally behave like generators. It would therefore be unjust and unreasonable to price non-voltage support services as though storage facilities were transmission assets except in cases where it can be demonstrated that a storage facility provides services for which an independent generator, providing similar services, would be compensated as serving a transmission function. The Notice is rightly concerned that “potential cross-subsidization, competition, and discrimination issues could arise if the storage participated in those [energy and ancillary services] markets at the same time it is receiving full cost-recovery through transmission rates.”

16. In the absence of a guarantee of overall cost recovery, the Commission need not regulate how the owners of electric storage facilities conduct their businesses as long as their conduct is consistent with reliable power system operation and not manipulative of market prices. With the foregoing qualifications, the owners of storage facilities should be allowed to buy and sell energy and ancillary services on their own account as they please, and should also be allowed to provide contract storage services on behalf of any willing parties who wish to purchase such services. When offering contract storage services, the question of the ownership of the stored energy should be a matter of negotiation between the owner of the storage facility and its prospective customer.

VI. REGIONAL TRANSMISSION ORGANIZATIONS SHOULD DISPATCH ELECTRIC STORAGE FACILITIES IN A MANNER SIMILAR TO THE DISPATCH OF OTHER RESOURCES.

17. Except when needed to assure power system reliability and to avoid market manipulation, generators in RTO footprints have the right to make their own commitment and dispatch decisions if they so choose. Nonetheless, conventional generators usually allow RTOs to optimally allocate their capacity between energy and ancillary services in each dispatch interval. RTOs determine the optimal allocations on the basis of generators' bids and declared operational constraints, and are not responsible for generators' failure to achieve maximum profits when the RTOs' inevitable forecasting errors lead to non-optimal commitment of generation resources.

18. RTOs can provide an analogous commitment and dispatch service to electric storage facilities. On the basis of storage facilities' bids and declared operational constraints, RTOs can determine when such facilities should consume power and produce power to maximize the facilities' real-time profits. As with conventional generators, the RTOs would not own the stored energy nor would they be responsible for the storage facilities' failure to achieve maximum profits due to the RTOs' inevitable forecasting errors. Except when needed to assure power system reliability and to avoid market manipulation, owners of storage facilities should nonetheless have the right to make their own commitment and dispatch decisions if they so choose.